

Multisite Pacing in Intact Myocardium and after Acute Myocardial Infarction: Experimental Study

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Abstract:

Background: Left ventricular (LV) pacing is unsuccessful in a significant number of patients, mainly due to sub-optimal LV pacing location. Nevertheless, data about the impact of different pacing sites on LV function in intact and ischemic myocardium are scarce.

Objectives: To investigate the effect of combinations of alternative LV pacing sites on LV mechanics, in the intact myocardium and after experimental acute anterior myocardial infarction (AMI), in order to define the optimal configuration.

Methods: Atrioventricular epicardial pacing at alternative pacing sites was performed in 16 healthy pigs simultaneously, before and after AMI. Hemodynamic parameters together with classic and novel echocardiographic indices were used to evaluate the effect of each pacing combination. Speckle tracking technique using Echo PAC software was used.

Results: In intact myocardium, most LV performance variables measured, including deformation parameters were adversely affected during pacing (in all combinations, all variables $p < 0.05$).

Conclusions: In intact myocardium, LV function is depressed in comparison to sinus rhythm, in every combination of pacing sites studied. However, during AMI the combination of pacing LV apex lateral wall and LV basal posterior wall managed to maintain the LV function at a level comparable to the sinus rhythm.

Keywords: Pacing; Torsion; Acute myocardial infarction; Cardiac mechanics